

CLAIMS

1. A positive resist composition, comprising a resin component (A), which contains acid dissociable, dissolution inhibiting groups and exhibits increased alkali solubility under action of acid, and an acid generator component (B) that generates acid on exposure, wherein

said resin component (A) is a copolymer (A1) comprising a first structural unit (a1) derived from hydroxystyrene and a second structural unit (a2) derived from a (meth)acrylate ester having an alcoholic hydroxyl group, in which a portion of hydroxyl groups of said structural units (a1) and alcoholic hydroxyl groups of said structural units (a2) have been protected with said acid dissociable, dissolution inhibiting groups, and said acid generator component (B) comprises a diazomethane-based acid generator and an onium salt-based acid generator.

2. A positive resist composition according to claim 1, wherein at least 10 mol% but no more than 25 mol% of a combination of said hydroxyl groups of said structural units (a1) and said alcoholic hydroxyl groups of said structural units (a2) are protected with said acid dissociable, dissolution inhibiting groups, and a weight average molecular weight of said copolymer (A1) prior to protection with said acid dissociable, dissolution inhibiting groups is at least 2,000 but no more than 8,500.

3. A positive resist composition according to claim 1, wherein in said copolymer (A1), a molar ratio between said structural units (a1) and said structural units (a2) prior to protection with said acid dissociable, dissolution inhibiting groups is within a range from 85:15 to 70:30.

4. A positive resist composition according to claim 1, wherein said structural unit (a2) is a structural unit derived from a (meth)acrylate ester containing an aliphatic polycyclic group having an alcoholic hydroxyl group.

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5. A positive resist composition according to claim 4, wherein said structural unit (a2) is a structural unit derived from a (meth)acrylate ester containing an adamantyl group having an alcoholic hydroxyl group.

10 6. A positive resist composition according to claim 1, wherein said acid dissociable, dissolution inhibiting groups are 1-lower alkoxyalkyl groups.

7. A positive resist composition according to claim 1, wherein said copolymer (A1) further comprises a third structural unit (a3) derived from styrene.

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8. A positive resist composition according to claim 1, wherein a polydispersity (Mw/Mn ratio) of said copolymer (A1) prior to protection with said acid dissociable, dissolution inhibiting groups is no greater than 2.0.

20 9. A positive resist composition according to claim 1, further comprising a nitrogen-containing organic compound.

10. A positive resist composition according to claim 1, which is used for forming a positive resist film within a method of forming a resist pattern in which a positive resist
25 film provided on a substrate is selectively exposed, a developing treatment is used to

form a resist pattern, and said resist pattern is then subjected to thermal flow treatment, thereby narrowing said resist pattern.

11. A method of forming a resist pattern, comprising the steps of forming a positive resist film on top of a substrate using a positive resist composition according to claim 1, conducting a selective exposure treatment of said positive resist film, and performing a developing treatment to form said resist pattern.

12. A method of forming a resist pattern according to claim 11, wherein said resist pattern formed by performing a developing treatment is subjected to a thermal flow treatment, thereby narrowing said resist pattern.

13. A positive resist composition, comprising a resin component (A), which contains acid dissociable, dissolution inhibiting groups and exhibits increased alkali solubility under action of acid, and an acid generator component (B) that generates acid on exposure, wherein

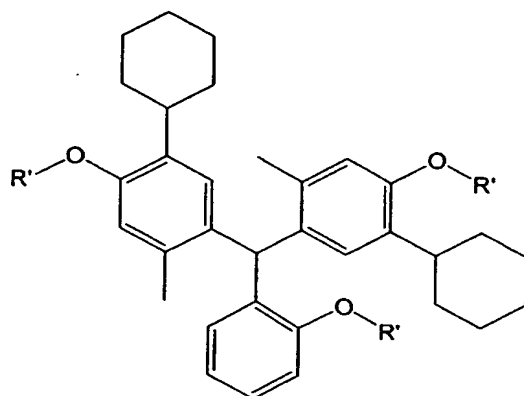
said resin component (A) is a copolymer (A1) comprising a first structural unit (a1) derived from hydroxystyrene and a second structural unit (a2) derived from a (meth)acrylate ester having an alcoholic hydroxyl group, in which a portion of hydroxyl groups of said structural units (a1) and alcoholic hydroxyl groups of said structural units (a2) have been protected with said acid dissociable, dissolution inhibiting groups, and

said composition further comprises a compound (C), which contains at least one acid dissociable, dissolution inhibiting group, and which under action of acid generated from said component (B), undergoes dissociation of said dissolution inhibiting group, generating an organic carboxylic acid.

14. A positive resist composition according to claim 13, wherein said component (C) is a phenol derivative containing from 1 to 6 substituted or unsubstituted benzene rings, with a weight average molecular weight within a range from 200 to 1,000.

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15. A positive resist composition according to claim 14, wherein said component (C) is a compound represented by a general formula (1) shown below:



... (1)

(wherein, R' represents an acid dissociable, dissolution inhibiting group).

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16. A positive resist composition according to claim 15, wherein within said general formula (1), R' represents a tert-butyloxycarbonylmethyl group.

17. A positive resist composition according to claim 13, wherein at least 10 mol% but no more than 25 mol% of a combination of said hydroxyl groups of said structural units (a1) and said alcoholic hydroxyl groups of said structural units (a2) are protected with said acid dissociable, dissolution inhibiting groups, and a weight average molecular weight of said copolymer (A1) prior to protection with said acid dissociable, dissolution inhibiting groups is at least 2,000 but no more than 8,500.

18. A positive resist composition according to claim 13, wherein in said copolymer (A1), a molar ratio between said structural units (a1) and said structural units (a2) prior to protection with said acid dissociable, dissolution inhibiting groups is within a range
5 from 85:15 to 70:30.

19. A positive resist composition according to claim 13, wherein said structural unit (a2) is a structural unit derived from a (meth)acrylate ester containing an aliphatic polycyclic group having an alcoholic hydroxyl group.

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20. A positive resist composition according to claim 19, wherein said structural unit (a2) is a structural unit derived from a (meth)acrylate ester containing an adamantyl group having an alcoholic hydroxyl group.

15 21. A positive resist composition according to claim 13, wherein said acid dissociable, dissolution inhibiting groups are 1-lower alkoxyalkyl groups.

22. A positive resist composition according to claim 13, wherein a polydispersity (Mw/Mn ratio) of said copolymer (A1) prior to protection with said acid dissociable,
20 dissolution inhibiting groups is no greater than 2.0.

23. A positive resist composition according to claim 13, further comprising a nitrogen-containing organic compound (D).

24. A method of forming a resist pattern, comprising the steps of forming a positive resist film on top of a substrate using a positive resist composition according to claim 13, conducting a selective exposure treatment of said positive resist film, and performing a developing treatment to form said resist pattern.

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25. A method of forming a resist pattern according to claim 24, wherein said resist pattern formed by performing a developing treatment is subjected to a thermal flow treatment, thereby narrowing said resist pattern.